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ABSTRACT

The National Center on Education and Employment has taken on the task of challenging and rethinking the premises that underlie traditions of human capital development in this country. This task is summarized in the question, "Who should teach which work-related skills to whom, when, and how?" Its first priority is that the Center's primary audience is educational policymakers. Second, the Center concentrates on two of the most powerful human capital pressures on the economy--the need for worker adaptability or flexibility and the quality of the labor supply. Third, its primary objective is to spearhead a major restructuring of K-12 education. Fourth, in rethinking K-12 education, the Center challenges distinctions between work-related and general learning. Fifth, the Center questions distinctions made between at-risk and not-at-risk learners. Finally, the Center challenges the assumption that the nation's educational and training delivery systems--for example, schools, the military, the corporate training system, and public training programs--differ substantially in their pedagogic strategies. (YLB)

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BREAKING OUT OF THE CIRCLE: RETHINKING OUR ASSUMPTIONS ABOUT EDUCATION AND THE ECONOMY

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Occasional Paper No. 2

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PREFACE

The National Center on Education and Employment is funded by the Office of Educational Research and Improvement (OERI) of the U. S. Department of Education. The Center is based at Teachers College, Columbia University, in New York City, and the RAND Corporation of Santa Monica, California, and Washington, D.C., is a partner with Teachers College in this enterprise.

This publication appears in the Center's Occasional Paper Series. This series is designed to communicate thinking stimulated by the Center's research, not the technical results of the research itself. It also serves to communicate important presentations by the Center research staff to colleagues at other institutions. Although candidate publications for this series are reviewed internally by the leadership of all of the institutions involved with the Center, they are not subjected to external peer review.

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Good morning. I'm glad to join you today. The National Center on Education and Employment that I direct has several connections to the ASTD. Your organization is one of our Center Associates that work with us to communicate thinking that is emerging from our research activities. A member of your Board, Badi Foster, and a Vice-President of your organization, Anthony Carnevale, are both members of our National Advisory Panel.

I want to describe to you today the priorities of the National Center. In doing so, I will describe research that I believe will be of special interest to you.

Whether out of courage or sheer foolishness, the National Center took on a very tough task: challenging and rethinking the premises that underlie traditions of human capital development in this country. We summarize this task in the question, Who should teach which work-related skills to whom, when, and how?

We chose this mission on the basis of our reading of profound changes in the nature and quality of the skills demanded in the economy, the labor supply, and the institutional mechanisms by which this country tries to create the human capital that the economy needs.

In taking on this task, one problem we faced was that we had few mature bodies of disciplinary knowledge to help us. There was human capital theory, but, as any economists in this room know so well, its current concepts, theoretical structure, and empirical work can provide only partial help.

The psychological literature on learning should have helped us identify the fundamental cognitive skills that individuals need in the workplace and the processes by which they acquire them. However, this literature was surprisingly silent on these questions. As Sylvia Scribner, a member of the Center's research staff, has noted, we so often call for education in skills for learning that we forget that we know almost nothing about what it takes to be a good learner outside of school. Most work on learning skills concentrates on the school learner. However, the discontinuities between school and work that I will describe later should make us suspicious of attempts to directly transfer what we know about skills for learning in school to the problem of developing capabilities for learning outside of school.

Finally, when we turned to the policy research literature on issues of education, training, and employment, we found an enormous literature that, on the face of it, should have been germane. However, we find that it is a literature about policies that rest on unexamined and increasingly questionable--if not discredited--assumptions.

We had to break out of the circle. As we sought to set our priorities, those involved with us suggested several eminently reasonable grounds for limiting the scope of the Center. These suggestions came out of a vocabulary of choice that has governed both research and policy in this country for the last two decades. They included the following.

o A choice among audiences for the Center's work--for example, the corporate world versus educators versus public policymakers.

o A choice of one side of several loosely related antonyms: a vocational versus an academic high school education; a liberal arts versus professional or occupationally-oriented post-secondary education; "education" versus "training"; "general" versus "specific" skills; and school-based versus work-based learning.

o A choice between subsets of occupations, distinguished in some way by their implications for pedagogic content and process.

o A choice between what are called "at risk" individuals (students or workers) and those not at risk.

o A choice among the nation's educational and training delivery systems--for example, elementary and secondary schools, the post-secondary educational or training system, the corporate training system, and the public sector training system.

What these choices tended to assume was that school-based and work-based learning differ (and should differ); that the pedagogic strategies of our different educational and training systems differ (and should differ); that at-risk and not-at-risk individuals differ in how they learn; and that the skill requirements of the economy reside in some categorization of occupations.

The distinctions that underlie these proposed bases for choice may ultimately prove fruitful in some form. However, the Center is explicitly challenging--or least temporarily suspending--them. I suspect that even where a distinction proves fruitful, the Center's work will redefine its meaning. The ground on which we now stand--our priorities--are the following.

First: the Center's primary audience is educational policymakers.

Our funder is the Department of Education, and we must ensure that our work ultimately advances the nation's human capital development by those classes of institutions for which the Department has public leadership responsibility. However: as I think I show later, progress here should meet many of the needs of our other audiences, including those committed to human resource development--although not in as targeted a way as if we had taken concerns such as yours as primary.

Second: the Center will concentrate on two among the most powerful human capital pressures on the economy. The first is the ability of workers to deal with discontinuity--the need for "adaptability" or "flexibility". The second is the quality of the labor supply.

The issue of discontinuity and adaptability challenges the idea that the skill requirements of the economy reside in some categorization of occupations. If we are to use occupations, however categorized, to define skill

requirements--and therefore work-related pedagogy, the technological and social structure of work has to change relatively slowly and workers have to operate in an economy that can assure reasonable job continuity. The Center's empirical work on changes in the nature and structure of work fundamentally questions the existence of these conditions.

The issue of the quality of the labor supply moves the issue of the economic success of at-risk populations more centrally into view than we had originally planned. However, the country's demographics are inescapable. We had to address questions about the human capital development of at-risk populations. However, as I discuss later, the choice does not imply that we start with the assumption that at-risk learners differ fundamentally from not-at-risk learners.

Third: the Center's primary objective is to spearhead--or at least to stand in the forefront of--formulating and testing a major restructuring of K-12 education that goes beyond and differs from the current back-to-basics reform.

Although our ultimate target is elementary and secondary education, we believe that we will succeed here only by understanding how the organization of work differs from the organization of school-based learning, and how adult workers confront and develop competence in discontinuous, non-routine situations--for example, in cases of technical breakdown or restructured jobs.

Fourth: in rethinking K-12 education, the Center will challenge distinctions between work-related and "general" learning.

From this basic challenge cascades an array of other challenges--challenges to distinctions between a vocational and an academic high school education; between a liberal arts and professional or occupationally-oriented post-secondary education; between "education" and "training"; between "general" and "specific" skills; and between school-based and work-based learning processes.

This challenge is at the heart of our thinking. It emerges partly out of path-breaking work being conducted by Sylvia Scribner at the Center and by colleagues scattered across the country. However, their challenge is echoed in other quarters--for example, among some vocational educators, although in statements less cogently phrased and less tied to theory and empirical studies.

Lauren Resnick, a colleague of Scribner's, compellingly summarized this challenge in her Presidential Address at the American Educational Research Association's meeting in Washington, D.C., this April. She delineates four broad contrasts between in-school and out-of-school mental activity. This set of contrasts raises profound questions about the utility and effectiveness of schooling for all non-school activity, including work of all types, and for all learners, whether at-risk or not-at-risk.

The first contrast is between individual cognition in school versus

shared cognition outside. For the most part, school is designed so that one student's success or failure at a task is independent of what other students do (aside from grading on a curve). By contrast, a great deal of activity outside of school is socially shared: work, personal life, and recreation take place in social systems in which what one person is able to do depends fundamentally on what others do and in which "successful" functioning depends upon the mesh of several individuals' mental and physical performances.

The knowledge necessary to perform most tasks are distributed through a work group. Furthermore, an important aspect of knowledge is built into the tools used. Thus, there is a further sharing of knowledge with tools and builders of tools, who are not present during the performance of a task, but who are part of the total knowledge system required for successful performance.

The second contrast is between pure mentation in school versus tool manipulation. In school, the greatest premium is placed on "pure thought" activities--what individuals can do without dependence on "external crutches"--whether books and notes, calculators, or other complex instruments. While some of these tools may be used, even encouraged, during "learning," they are almost always absent during tests of performance. Thus, school becomes an institution that values thought that is independent of the physical and cognitive tools that are a vital and defining part of virtually all practical activity. Out of school, by contrast, most mental activities are intimately involved with and shaped by the physical and intellectual tools available. Tool use is not only a way for people of limited education to participate in cognitively complex activity systems. It is also a way of enhancing capacity for highly educated people well beyond what they could do independently.

The third contrast is between symbol manipulation in school versus reasoning about things and situations that make sense to people outside of school. School learning is mostly symbol-based, to such an extent that connections to the things being symbolized are often lost. Outside of school,actions are intimately connected with things and events. Quoting Scribner's work, Resnick notes that men taking inventory in a dairy warehouse use the physical environment as part of their arithmetic calculations. They know exactly how many cases will fill a given space, and subtract from this number the number of cases that they can visually see to be missing from the "cube" that would be formed if the space were completely filled. Thus, these men do less work that is recognizably arithmetic than we might have expected, but they are getting reliable arithmetical results. They are doing this by treating the stuff of the world as part of their calculation process, rather than just operating on numbers.

Out of school, because one is engaged with things and situations that make sense to people, people do not fall into the trap of forgetting what their calculations or their reasoning is about. Their mental activities make sense in terms of their immediate effects, and their actions are grounded in the logic of immediate situations. In school, however, there is a very large tendency for symbolic activities to become detached from any meaningful context. School learning then becomes a matter of learning rules and saying

or writing things according to the rules. This focus on symbols detached from their referents can create difficulties even for school learning itself. For example, it can lead to systematic and persistent errors of a kind that seem virtually absent in practical arithmetic.

In other words, the process of schooling seems to encourage the idea that the "game of school" is to learn symbolic rules of various kinds, and that there is not supposed to be much relationship between what one knows outside of school and learning in school. The evidence is growing that not only may schooling not contribute in a direct and obvious way to performances outside of school, but knowledge acquired outside of school is not always used to support in-school learning. Schooling is coming to look more and more isolated from the rest of what we do.

The fourth contrast is between generalized learning in school versus situation-specific competencies outside. In school we aim for general, widely usable skill and theoretical principles. Indeed, the major claim for school-type instruction is, usually, its generality and its power of transfer. Yet outside, to be truly skillful, people must develop situation-specific forms of competence. The "packages" of knowledge and skill that schools provide seem unlikely to map directly onto the clusters of knowledge they will actually use in their work. This seems true even for highly technical knowledge, where "schooling" is intended to provide direct professional training. Studies of expert radiologists, electronic trouble-shooters, and lawyers all reveal a surprising lack of transfer of theoretical principles, processes, or skills learned in school to professional practice. All of this points toward the possibility that very little can be transported directly from school to out-of-school use. Both the structure of the knowledge used and the social structure of its use may be more fundamentally mismatched than we had previously thought. (Lauren Resnick, Learning in School and Out, Presidential Address, American Educational Research Association, April 22, 1987.)

At the same time, Resnick makes a telling point consistent with the results of many human capital studies in economics. Situation specific learning by itself is very limiting. Studies have shown that when the situation is changed from the familiar--for example, by asking bookies in Brazil to accept unusual bets that cannot be constructed from their tables (Carrahers and Schliemann)--unschooled individuals have a great deal of difficulty and may fail entirely. Schooled people do better, although--and this is an important point--they rarely use the supposedly general algorithms that they have been taught in school and instead invent new solutions specifically appropriate to the situation at hand.

Given the Center's objectives, a central question for us is what it is about more education that helps produce this ability to adapt in the face of transitions and breakdowns. We can surmise that more education provides students with more alternative ways to think about the unfamiliar. However, we do not know if this is the case, or how individuals draw on greater schooling to deal with discontinuity, or how the ability to deal with breakdown and transition is most effectively developed. To make progress here, we need to understand more than we do now about how to use school to

here, we need to understand more than we do now about how to use school to promote skills for learning in practical settings. As Resnick notes, we badly need studies, not just of experts in various fields, but of people in the course of becoming experts. Scribner's work positions the Center squarely at this frontier.

Fifth: the Center questions distinctions made between at-risk and not-at-risk learners.

By at-risk learners I mean those who do not perform well in traditional schools or training programs arranged like traditional schools, either because they are not very good at standard academic subjects or--and this is an exceedingly important "or"--because they do not want to be or do not see the point of being good at them. It is important to note that although at-risk children come disproportionately from poor families, almost everyone in this audience either has a child of this sort or friends with a child of this sort. No group escapes this problem.

In thinking through K-12 reforms to connect better to at-risk learners, we want to start by questioning the frequent assumption that at-risk and not-at-risk populations differ in how they learn most effectively. Although it is an empirical issue, we suspect two things. First, variations in school performances may attest partly to individual differences in the willingness to tolerate or make some sense out of a school-based experience that is relatively isolated from non-school experiences. And, second, these differences in turn may partly reflect differences between at-risk and not-at-risk students in the futures that they expect for themselves--in their visions of their adult "places" in the world.

I suggest that all children develop an image of their niche in the adult world--in the ecological sense of niche. Their ideas about the ecology of adult "places" may be distorted and are usually pitifully and pathetically partial. However, they seem to work out notions of their basic futures and of the trajectories relevant to them, even if they cannot state these explicitly. And they act on these ideas, such as electing into or out of advanced mathematics, depending on their sense of occupational destination.

For example, I analyzed data from a national longitudinal survey of youth, concentrating on the 14 to 17 year olds in the sample. The purpose was to understand the dynamics that underlie the traditionality of young girls' occupational choices. What drove these girls' occupational choices were fundamental choices about what kinds of commitments they expected to make as adults. The adult agendas that these girls had for themselves revolved around the basic issue of family versus work. Their commitment to one or the other (or to some balance between them) drove the traditionality of their occupational choices, which in turn drove the future educational investments that they expected to make. We can note that these agendas were fully developed even for the 14 year olds, indicating that their concepts of their futures had to have been forming well before the age of 14.

I doubt that these girls knew that many of their future plans simply cascaded from and elaborated a fundamental choice of direction. In other

words, I do not think that most of these girls could have cogently described the structure of choices that lay so clearly in the data. Nonetheless, I suggest that the basic behaviors of all children, at-risk and not-at-risk, can be interpreted from the perspective of what place they can envision for themselves.

For example, I suggest that the girl who becomes the teenage mother, although we hear a great deal about her "wanting someone to love," is more fundamentally taking the action that lets her occupy the niche of "mother," a place in the adult firmament that best fits how she sees her talents and opportunities. (Never mind the destructive potential of that choice that we can see.) From this perspective a decision to keep the baby is essential to implementing her sense of place in the world--and our attempts to contain the damage of teenage pregnancy by trying to persuade her to put the baby up for adoption attests more to our dimness than to hers.

Similarly, the child who scrapes by to high school graduation, or who drops out--or behaves so intolerably that he or she is pushed out, may not be able to envision and emotionally claim an adult future that requires the core curriculum of the high school. When schools concentrate on narrow verbal and mathematical-logical skills, though Lord knows that these are important, I suggest that we may inadvertently limit their vision to jobs that are highly academic in content, whereas in fact only a small share of total jobs are of this nature. As Howard Gardner, the Harvard psychologist and author of Frames of Mind, noted in an interview with the New York Times, "We subject everyone to an education where, if you succeed, you will be best suited to be a college professor." (November 9, 1986, Education Section, New York Times, p.23)

And if a child cannot envision participating in adult jobs that are highly academic in content, two things happen. First, the child cannot look to the school for his or her sense of ultimate place and trajectory--he or she must look elsewhere, and the school, in a basic sense, has lost the child. And second, instruction in academic skills will become "irrelevant" to the child--or, in decision theory terms, without "utility." Decision theory presumes and countless studies show that individuals--children and adults, at-risk children and not-at-risk children--do things that have utility for them--that connect to what they want or where they expect to be going.

In sum, the contrasts between in-school and out-of-school mental activity that Resnick describes suggest that school-based learning is not particularly related to out-of-school activity for any child. However, it seems least related for those children who lack the ability, or confidence, or desire to engage in more symbol-based activity when they grow up, such as the professional occupations. From this perspective, traditional schools may be creating their own problems in reaching their own in-school learning goals and helping to produce the "at-risk" child.

Finally: the Center will challenge the assumption that the nation's educational and training delivery systems--for example, schools, the military, the corporate training system, and public training programs--differ substantially in their pedagogic strategies.

We suspect that they are much more similar than the rhetoric implies, and that all are encountering problems because they share some of the same pedagogic problems. In the military, community colleges, and proprietary training institutes a classroom culture dominates, and there are difficulties in the transition to actual job functioning. We suspect that even though technical education has increasingly adopted highly technical delivery systems and "individualization," it is still primarily individual, symbolic, and theoretical in its content and manner of delivery and inadequately uses the tools, situations, and objects found in real-world work to build truly expert performance skills.

We suspect that the story is much the same in corporate classrooms for management training. Although corporate education, including management training, has not been systematically studied, these ventures seem to have copied school. People go to classes, take tests, and proceed through a sequence of activities more like what they know in school or college than what they will encounter when they move on to their next job assignment or return to their old one. Accordingly, these training programs may share the advantages and disadvantages of traditional schools.

Finally, we see similar problems even in training for the highly skilled professions. There is a continuing tension in all professional fields between the "formal education" part of training and the practical or clinical part.

We agree with Resnick that these and other ideas point to a possible redirection of schooling--and, we would add, post-secondary, military, corporate, and public training programs. This redirection would focus on forms of thinking and learning that share more of the fundamental features of successful out of school functioning. Specifying and testing this possibility involves a set of tasks that go way beyond the Center's resources and beyond the next three years. However, we do not have to carry these questions alone--more and more researchers share them and are starting to work on them. The problem for us is placing our bets carefully.

The National Center on Education and Employment based at Teachers College, Columbia University, and in partnership with The Rand Corporation, is committed to research the issues that I have talked about today. We are in this game for the long haul, as, so clearly, are you. I hope that we can be of service to you in the months and years to come. Please let me know if we can. Thank you.